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REVIEWS

West Virginia Geological Survey. Marion, Monongalia and Taylor Counties. By RAY V. HENNEN. 1913. Pp. 844, pls. 33, figs. 11, maps 3; Cabell, Wayne and Lincoln Counties. By C. E. KREBS. Pp. 483, pls. 26, figs. 6, maps 9.

The report on the counties of Marion, Monongalia, and Taylor discusses the industrial development, the physiography, the geology, and the mineral resources of this district. These counties are in the northern part of the state in the heart of the Appalachian coal field. They are exceedingly productive of gas and oil and are rich in building stones, glass sands, and clays. To all this must be added great agricultural fertility.

The surface of the region has been eroded to a strikingly mature stage; it is almost entirely a country of steep slopes and very narrow divides. Structurally this district forms part of the eastern flank of the Appalachian Basin. The formations have a general western dip which is modified by local folds. The structure contours on the geological map make it evident that the gas has generally collected in the tops of the anticlines, and that the oil has been found most abundantly upon the flanks of the anticlines. A general section of the strata is as follows:

Upper Carboniferous (Pennsylvanian), 2,300-2,800 feet:

Dunkard, or Permo-Carboniferous Series, 1,100-1,200 feet

Monongahela Series, 260-400 feet

Conemaugh Series, 500-600 feet

Allegheny Series, 225-350 feet

Pottsville Series, 250-300 feet

Lower Carboniferous (Mississippian), 450-1,000 feet:

Mauch Chunk Shales, 40-250 feet

Greenbrier Limestone, 15-150 feet

Pocono Sandstones, 400-600 feet

Devonian:

Catskill Sandstones, 300-500 feet

Chemung and Hamilton Shales, penetrated in Wheeling deep well nearly 2,000 feet without reaching the Carboniferous.

The Dunkard beds are the so-called "Barren Measures," but they carry several seams of coal; these are unimportant commercially but

they are useful for purposes of stratigraphical correlation. The Monongahela series carries the famous "Pittsburgh" coal bed. It is from 8 to 10 feet thick, mined from nearly 60 mines in this one district. The "Sewickley" is generally about 6 feet thick; it is second only to the Pittsburgh coal in economic importance. In the Allegheny series the most valuable coal seams are the Upper and the Lower Kittanning.

The Pocono series consists of alternating beds of sandstones and brown shales. It has been of enormous economic importance, because it contains four oil sands: the Keener, Big Injun, Squaw, and Berea. Oil and gas have been produced from various sands between the Moundsville in middle Conemaugh series down to the Bayard sand near the bottom of the Catskill beds; this is a vertical range of about 1,000 feet.

The report is accompanied by a set of three maps, to make plain the topography, the soils, and the economic geology of the district. The structure contours on the geological map are of especial value and significance in relation to the deposits of coal, gas, and oil.

Cabell, Wayne, and Lincoln counties are in the extreme western part of the state. Their topography is very rough, typically mature. The geological formations dip in a general northerly direction, but they have been somewhat warped by minor folding. The following formations outcrop in these counties, in the order of their appearance, starting from the north: the Dunkard, Monongahela, Conemaugh, Allegheny, and the Kanawha. The removal by erosion of the Monongahela from most of this area, and the irregularity and distribution of the Pittsburgh seam, where the formation still remains, prevent this district from being a great coal-producer. The coal of the Allegheny and Kanawha series is not enough to put these counties very far from the smallest coal-producers in the state. They produce about 100,000 tons per annum as compared with about 4,500,000 tons shipped from the mines of the other three counties reported upon.

The north-central part of these counties is a large oil-producing region; the report suggests that the southern part of the area will be a fruitful field for the oil and gas prospector.

For each of these counties there is a set of three maps which show the agricultural soils, the topography, and the general and economic geology. The maps are made on the scale of one inch to the mile; they have structure contours showing the depth below the surface of the economic deposits and the stratigraphical position of oil and gas accumulations.

T.T.Q.